

UTAH'S YEAR 2000 CHALLENGE

July 14, 1998

**A Report to the Executive Appropriations Committee
Office of the Legislative Fiscal Analyst**

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Summary

Utah's governmental entities have 17 months in which to correct their computer systems' inability to differentiate between the years 1900 and 2000. The Executive Branch believes about 45 percent of its systems are Year 2000 compliant, but that it will need an additional \$5 million to address remaining issues.¹ Higher Education has found 60 percent of its mission critical systems to be ready, and has said that remaining repairs will be funded with institutional resources.² Public Education reports that 88 percent of its centralized administrative systems can handle 2000 dates, and that it will require no additional state funds to fix or replace non-compliant systems before the millennium.³ However, neither Higher nor Public Education's assessments include the vast number of decentralized computers and embedded chips in use at schools and education offices statewide. And, the Executive Branch discovers new problem systems on a regular basis. Given the number of unknowns surrounding this issue and the past experience of states and the Federal government, statewide compliance costs could more than double in the next year. Yet funding and repairs are no longer the most ominous Year 2000 problems – liability, accountability, and contingency are.

Background

What is Y2K? The Year 2000 – or Y2K – bug is linked to efficiency measures instituted by early computer programmers. In an attempt to save valuable memory capacity, programmers, believing their work had a limited life-span, used two rather than four digits or spaces to identify centuries – “98” instead of “1998”. When systems that may have out-lived their design life enter the millennium, two-digit date fields will show “00”, making it impossible for the computer to differentiate between 1900 and 2000. Consequently, a system programmed to print benefit checks by formula two weeks from December 24, 1999, for example, would calculate the projected date to be January 7, 1900, assume that such date had passed 100 years ago, and fail to print the checks.

How bad is the problem? No one really knows. Until all software, hardware, and embedded systems⁴ in all companies, governments, and other organizations have been assessed, the size of the problem will remain a mystery. And, a number of actors have yet to recognize a problem exists. While some pundits believe the millennium bug has been blown out of proportion by those who stand to gain from its eradication, almost everyone agrees that January 1, 2000 will bring some degree of technology failure. Senator Robert F. Bennett, Chairman of the U.S. Senate's Special Committee on the Year 2000 Technology Problem, has said that the more he looks into the Y2K problem, the more worried he gets. Edward Yardeni, chief economist at Deutsche Bank Securities, has forecast a 70 percent chance of severe world-wide recession accompanied by deflation in the Year 2000, given the current pace of Y2K remediation.⁵

What can be done about it? As Senator Bennett has said, Y2K is as much a

management problem as it is a technology problem.⁶ While hundreds of systems analysts across the state work to assess, renovate, implement, and test information systems, senior decision makers must provide appropriate resources, identify potential operational impacts, and plan contingencies. Experts agree that the first step is to acknowledge the problem and make others aware of it. The second is to look inwardly at one's own enterprise, managing a solution. Next, one must investigate external impacts, anticipating and planning for factors that may be beyond one's control. Finally, and perhaps most importantly, leaders must frankly communicate the state of readiness to customers and constituents concerned about the problem.

Utah's Status

Executive Agencies: Utah's Chief Information Officer (CIO) and his staff have developed an Internet based reporting system to track agency progress with respect to specialized IT systems. The CIO's Internet site also offers state officials tools for addressing off-the-shelf hardware and software deficiencies. As of July 3, 1998, the CIO reported that, of all catalogued systems, 46 percent were compliant. Of the thirty state agencies tracked by the CIO, systems in seventeen are less than 50 percent fully compliant, with nine, including the Tax Commission and Department of Public Safety, being less than 25 percent fully compliant (see appendix A). The state has spent \$5,250,000 to date on 21 software systems that the CIO has identified as "highly-sensitive mission critical" (see appendix B). No estimate was available for the cost of other system renovations. In FY 1999, the Executive Branch received \$3.2 million in General Fund appropriations for Y2K, and will augment that with \$2 million in Federal funding as well as untold base resources. (For a snap-shot of Utah's status as compared with other states, see appendix C.)

Higher Education: The State Board of Regents has identified forty-four administrative systems that it considers mission critical. They include financial resources, human resources, student information, and financial aid systems at each of the nine higher education institutions. Of that total, about 60 percent are currently Y2K compliant. No centralized information yet exists on the compliance of hardware, custom departmental software, or embedded systems in Higher Education. A status report presented by the Utah Systems of Higher Education is included as appendix D.

Public Education: According to testimony before the Information Technology Commission on June 15 (appendix E), more than 88 percent of the Utah State Office of Education's (USOE) centralized computer systems were Y2K compliant as of June 12, 1998. The estimates included thirteen systems administered by USOE's Office of Agency Computer Services and six systems handled by its District Computer Services section. USOE did not report on the status of individual districts or the schools themselves.

Outlook

Executive Agencies: With 54 percent of its systems yet to be brought into

compliance, the state has set June 1, 1999 as its deadline for completion of all renovation and testing. Based on information provided by the CIO, on average, state agencies are progressing at a rate of 5 percent per month, thus meeting the deadline for inventoried systems is possible should the rate persist (see appendix F). Projected total costs have not been tabulated, but agencies will spend an additional \$7,350,000 in resources provided for FY 1999 on just those 21 systems identified in appendix B as highly-sensitive mission critical. The CIO has also identified \$4.8 million in Y2K funding needs for fiscal Year 2000, a portion of which may be included in a FY 1999 supplemental request. Of that amount, \$900,000 would be directed to ongoing renovation and testing, \$1.8 million would go toward identifying and eradicating non-compliant embedded systems, and \$2.1 million would fund outreach, emergencies, and contingencies.

Higher Education: In July and August of this year, colleges and universities in the state, other than the University of Utah, will upgrade their administrative systems to correct Y2K deficiencies. The University of Utah, which is replacing its non-compliant administrative systems, plans to complete work by June, 1999. The upgrades and replacements will be paid for with institutional funds. In the next few months, the Board of Regents will spend between \$150,000 and \$750,000 for an automated assessment tool to begin identifying problems with institution network systems and workstations. Information on compliance will be shared with individual institutions, but each institution will be responsible for implementing its own solutions. Departmental computing and embedded chips will not be centrally addressed. The Fiscal Analyst's Office has been notified that Higher Education's mission critical Y2K activities will require no additional state resources; however, individual institutions are now beginning to formulate requests for additional funding as noted below.

Public Education: The Utah State Office of Education reports that only 12 percent of its centralized systems still need to be renovated, and that no additional state funds will be required for this activity. However, USOE's assessment does not include specialized district-specific systems, standard hardware and software used in school offices and classrooms, embedded chips, or systems employed in Applied Technology Centers.

Outstanding Issues

Cost Escalation: As managers become more aware of the Year 2000 problem, estimates of cost continue to rise. Federal government Y2K projections have gone from \$2.3 billion to \$4.7 billion in the past year, (a more than 100 percent increase) and could rise by an additional 20 percent to 30 percent over time, according to John Koskinen, President Clinton's Y2K "czar". In April, California legislators proposed to nearly double that state's Y2K appropriation (from \$560 million to \$1.060 billion).

Potential Future Y2K Costs	
Embedded Systems	\$1,800,000
Contingency/Emergency Fund	2,000,000
Custom Software Systems	896,000
Outreach	100,000
Higher Ed Assessment	750,000
UVSC Renovation	1,800,000
Sub-Total	\$7,346,000
Agency Hardware & Software	Unknown
Colleges & Universities	Unknown
Public Schools and Districts	Unknown
Additional Embedded Systems	Unknown
State Liability	Unknown
Bail-outs	Unknown
Employment Incentives	Unknown

Utah's total Y2K costs are, at best, ambiguous. Eighteen months ago, in a presentation to the Capital Facilities and Administrative Services Appropriations Subcommittee, Utah's former CIO estimated that the "projected cost to fix Utah's problems" would total \$5.7 million for some six million lines of code.⁷ Now, with less than eighteen months to go, the state estimates that as much as \$12.6 million will be spent on highly sensitive mission critical systems alone, with \$5 million more required for additional information system repairs, contingencies, and embedded systems. Higher Education, which has only just begun assessment, has identified \$2.5 million in Y2K costs with only one institution reporting. The number of unknowns surrounding this issue makes an accurate cost calculation impossible, but according to state officials, the state's total Y2K costs are likely to top \$50 million, not including legal fees, damages, or bail-outs. At least \$7 million of that will likely be requested in future appropriations.

Contingency/Emergency Fund: As the Federal government has done, Utah's CIO is considering the establishment of a contingency/emergency fund to address unforeseen costs. An alternative approach to appropriating new funds, that used in Florida, is to grant the CIO limited power to reallocate base funding as well as reassign personnel across agencies to address the Year 2000 problem.

Agency Hardware and Software: The CIO's progress reports focus on specialized information systems, and do not account for standard software or hardware such as desk-top PCs. It is up to each agency individually to assess, renovate, validate, and implement solutions for these devices. Lacking centralized information, the Fiscal Analyst is unable to report progress on the replacement or renovation of these systems, or to project future costs that may be associated with such.

Colleges and Universities: While mission critical administrative systems at all public institutions of higher education in the state should be compliant by June, 1999, renovation of departmental computing, network systems, workstations, and embedded chips will be left to individual schools. With more than 30,000 computing devices and hundreds of facilities in Higher Education, the cost of fixing non-mission critical systems could be staggering. For instance, Utah Valley State College alone has reported to the CIO's office that it will request between \$1.3 and \$1.8 million in state funding for Y2K during the next budget cycle. Last year, the Board of Regents estimated that Y2K costs would approach \$14 million for Higher Education as a whole.

Public Schools and Districts: The centralized administrative systems coordinated by the State Office of Education appear nearly ready. However, no central assessment has taken place of district systems, school computer labs, or Applied Technology Centers. Public education institutions in other states have found costs associated with these items significant. The Philadelphia School District, for example, estimates it will require about \$175 per student to perform Y2K work. The Salt Lake public schools alone have over 25,000 students.

Embedded Systems: The CIO has only begun identifying chips embedded in mechanical devices such as boilers, electronic security systems, sprinklers, and elevators. The agency that likely administers most of those devices, the Department of Administrative Services, has compiled an inventory of such systems within its control. However, according to the CIO, other state agencies, such as the Department of Human Services and Department of Corrections, have only begun identifying systems at sites such as the State Hospital, state prisons, and youth correctional facilities. DHS has reported to the state's Y2K coordinator that its projected embedded system costs may increase by an additional \$3 million. Further, the vast number of public and higher education facilities makes very likely the discovery of additional non-

compliant embedded systems, and associated costs.

Liability Protection: Even given the best effort of a state to correct Y2K problems, states can expect individuals and organizations to sue for damages related to Y2K. According to the Council of State Governments, “[l]awsuits may seek to hold a state liable for losses resulting if the state can not fulfill its contracts. People who claim to be injured as a result of the state’s negligence – failing to correct the computer glitch that caused the injury – may seek pain and suffering damages under tort law. Federal civil rights laws allow class-action suits on behalf of individuals denied benefits, such as welfare, as a result of failed state computer systems.”⁸ Industry analysts estimate that Y2K legal costs alone could reach three to five times the cost of repairing non-compliant systems.

“Bail-out” Funds: Just as litigious entities may sue a state government for damages related to state activities, others may turn to the state’s deep pockets to repair damage done in the private sector, similar to the Savings and Loan or Chrysler Corporation bail-outs.

IT Employment Incentives: As Y2K activities create demand for IT expertise, states are experiencing a loss of qualified personnel. Utah, for instance, has seen an exodus of IT professionals to local governments in particular.

Contingency Plans: It should be noted that no state agency or educational institution has submitted a Y2K contingency plan. With only 17 months remaining until the new millennium, contingency planning is becoming increasingly important, especially as it relates to potential external impacts. State agencies have been directed by the CIO to prepare such plans by December, 1998.

Legislation Moratorium: Legislative changes effective January 1, 2000, such as income tax form and or formula alterations, may compound Y2K problems, diverting scarce IT resources. Some have suggested that a moratorium on such changes for a period of time surrounding January 1 would alleviate potential conflicts.

Other Entities: Neither this report nor the CIO’s tracking system considered the costs and/or progress of quasi-governmental entities such as the Workers Compensation Fund and Utah Retirement System, the courts, or the Legislature itself. However, a representative of the courts testified at the Information Technology Commission’s May meeting, and Leadership has requested that legislative offices present a similar report to the Commission on July 16. State legislatures may also have a responsibility to monitor Y2K in regulated entities, such as public utilities, and report progress to the public.

Recommendations

1. Direct the Fiscal Analyst to work with state agencies and educational institutions to refine Y2K estimates, targeting funding to at-risk mission-critical systems.
2. Direct the Fiscal Analyst to compare the merits of a contingency/emergency fund with that of increased central authority to redirect base funds to Y2K.
3. Pursuant to Section 2(7)(a)(i) of the Budgetary Procedures Act, request that the CIO and agency Executive Directors jointly, as well as the Superintendent of Schools and Commissioner of Higher Education, prepare written reports on the Y2K status of software, hardware, embedded systems, and contingency planning for submission to the Information Technology Commission with copies to the Executive Appropriations Committee prior to October 30, 1998.
4. Consider intent language stating that Y2K spending shall take priority over all other IT initiatives, and that agencies shall undertake no new IT initiatives unless and until the millennium problem is adequately addressed as certified by the CIO and agency Executive Director jointly, the Superintendent of Schools, or the Commissioner of Higher Education, as appropriate.
5. Work with statutory committees to address liability protection, bail-outs, employment incentives, legislation moratoria, and responsibility regarding regulated and quasi-governmental agencies.

State of Utah
Year 2000 Status of Inventoried Software Systems
July 3, 1998

Department	Total	No	Yes	Percent Fully Compliant
Alcoholic Beverage Control	8	4	4	50%
Attorney General	17	0	17	100%
Board of Pardons and Parole	3	1	2	67%
Crime Victim Reparation	1	1	0	0%
Dept. of Admin. Svcs.	45	28	17	38%
Dept. of Agriculture	31	1	30	97%
Dept. of Commerce	16	11	5	31%
Dept. of Comm. & Economic Dev.	5	2	3	60%
Dept. of Corrections	27	10	17	63%
Dept. of Environmental Quality	12	6	6	50%
Dept. of Health	90	58	32	36%
Dept. of Human Resource Mgt.	4	1	3	75%
Dept. of Human Services	91	65	26	29%
Dept. of Natural Resources	31	3	28	90%
Dept. of Workforce Services	14	10	4	29%
Financial Institutions	1	0	1	100%
Governor / Legislature	1	0	1	100%
Governor's Office	11	1	10	91%
Insurance	10	10	0	0%
Labor Commission	7	5	2	29%
National Guard	2	2	0	0%
Public Safety	15	13	2	13%
School for the Deaf and Blind	1	0	1	100%
State Auditor	1	1	0	0%
State Trust Lands	4	4	0	0%
Utah Cncl. on Crim. & Juv. Justice	2	2	0	0%
Utah Dept. of Transportation	61	8	53	87%
Utah State Office of Education	21	8	13	62%
Utah State Tax Commission	83	75	8	10%
Utah State Treasurer	2	2	0	0%
TOTALS	617	332	285	46%
PERCENT	100%	53.81%	46.19%	

Source: David Fletcher, Utah Y2K Coordinator, July 6, 1998.

State of Utah
Year 2000 Costs of Highly Sensitive Mission Critical Systems
June 3, 1998

Department	System	Overall Completion	Cost To Date	Remaining Cost	Completion Date
Public Safety	Drivers License	100 %	\$45,000	\$0	Oct-97
Public Safety	National Crime Info Center	0 %	\$0	\$45,000	Dec-98
Public Safety	Crime History Database	80 %	\$105,000	\$27,900	Sep-98
Public Safety	Statewide Warrants/POs	82 %	\$90,000	\$20,150	Oct-98
Workforce Services	UI Benefits	(a)	\$1,500,000	\$71,500	Oct / Nov 98
Workforce Services	UI Tax	50 %	\$1,900,000	\$1,600,000	Jul-99
Workforce Services	UI Wage Data	0 %	\$0	\$97,000	Apr-99
Workforce Services	UI Teleclaims	0 %	\$0	\$32,500	Jan-99
Workforce Services	UI Adjudication	5 %	\$6,000	\$120,000	Sep-98
Health	Screening & Testing Sys.	50 %	\$6,000	\$120,000	Dec-98
Health	Medicaid System	40 %	\$135,000	\$500,000	Dec-98
Human Services	USSDS	(b)	\$105,189	\$864,881	May-99
Human Services	ORSIS	(c)	\$239,970	\$3,128,732	Dec-98
Admin Services	Mainframe Environment	54 %	\$263,120	\$222,460	Oct-98
Admin Services	FINET	100 %	NA	NA	Mar-98
Tax Commission	Sales Tax System	15 %	\$5,000	\$322,000	Mar-99
Tax Commission	Fuel Tax System	70 %	\$89,000	\$34,000	Dec-98
Tax Commission	Income Tax System	80 %	\$430,000	\$44,000	Dec-98
Tax Commission	Motor Vehicle System	80 %	\$61,000	\$44,000	Dec-98
Tax Commission	Corporate Tax System	65 %	\$149,000	\$34,000	Dec-98
Tax Commission	Oil and Gas Tax System	80 %	\$121,000	\$25,000	Dec-98
TOTALS			\$5,250,279	\$7,353,123	

(a) Rewritten in 1996	(b)	Inventory	100 %	(c)	Inventory	100 %
		Assessment	100 %		Assessment	80 %
		Remediation	80 %		Remediation	80 %
		Test	20 %		Test	10 %
		Implementation	30 %		Implementation	80 %
		Contingency Planning	5 %		Contingency Planning	10 %

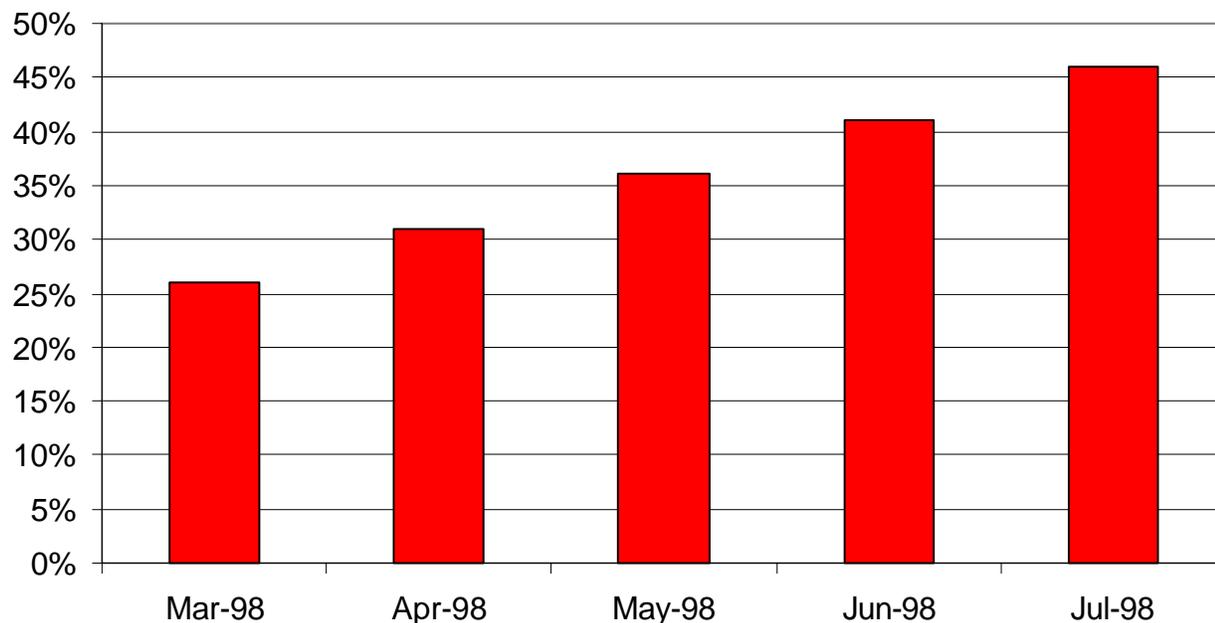
Source: David Fletcher, Utah Y2K Coordinator, July 6, 1998.

**Status of Y2K by State
April, 1998**

	Implementation Complete (%)	Estimated Costs (\$M)
Alabama	NA	85-102
Arizona	45	100
Arkansas	NA	35-60
California	33	243
Colorado	7	37
Connecticut	25	135
Delaware	47	9
Florida	15	75-90
Georgia	NA	152
Hawaii	40	16
Idaho	35	16
Illinois	29	67
Indiana	18	45
Iowa	40	33
Kansas	35	25
Kentucky	40	34
Maine	37	8-10
Maryland	NA	100
Massachusetts	38	NA
Michigan	39	57
Minnesota	5	50
Mississippi	30	19
Missouri	10	57
Montana	35	3
Nebraska	70	17
Nevada	30	6
New Jersey	30	100
New Mexico	68	12
New York	35	250
North Carolina	20	132
North Dakota	40	2
Ohio	30	61
Oregon	25	92
Pennsylvania	50	48
Rhode Island	NA	10-20
South Carolina	NA	30
South Dakota	36	4
Tennessee	67	NA
Texas	35	110
Utah	40	6
Virginia	30	80
Washington	79	83
West Virginia	80	NA
Wisconsin	40	45-50
Wyoming	40	12-15

Source: National Association of State Information Resource Executives, *Quick Survey on Year 2000 Remediation in the States*, April, 1998.

State of Utah Year 2000 Progress Progress in Systems Reported as 100% Compliant



Based on trends demonstrated this year, we would expect substantial compliance for all systems by June 1999. Some of the growth shown in compliant systems as reported by the agencies may be due to failures by the agencies to fully report during the initial periods.

Source: David Fletcher, Utah Y2K Coordinator, July 6, 1998.

NOTE: While the rate of progress reported by the CIO supports a June, 1999 completion date, this rate is based on somewhat misleading data. The CIO's inventory of systems includes those systems that are compliant at the outset. Additional systems are added to the inventory each month, some of which are already compliant, thus overstating progress and masking the status of non-compliant systems. A more precise indicator of risk would measure progress against a predefined baseline of non-compliant systems. The state systems of higher and public education do not currently report progress to the CIO. They do, however report status intermittently to the Information Technology Commission.

Peer Review:

An exposure draft of this report was sent to representatives of the Executive Branch, Board of Regents, and State Office of Education on July 8 and 9, 1998. Comments received prior July 14 have been incorporated as appropriate.

End Notes:

1. Moon, Dave, and David Fletcher by interview, July 6, 1998.
2. *USHE Institutional Technology Needs Including Year 2000 Status*, as presented to the USHE Master Planning Task Force on Technology, June 29, 1998.
3. *USOE Office of Agency Services/District Computer Services, Summary of Services*, Utah State Office of Education, June 15, 1998.
4. Embedded systems are pre-programmed computer chips incorporated into mechanical devices, like boilers, elevators, locks, valves, and switches. If these embedded chips make calculations that rely on dates, they may fail on January 1, 2000.
5. *Economist Sees Severe Year 2000 Recession Probable*, Reuters, June 30, 1998.
6. Bennett, Senator Robert F., keynote address before the Center for Strategic and International Studies conference *The Y2K Crisis: A Global Ticking Time Bomb*, June 2, 1998.
7. *The Year 2000 Century Date Change: The World's Largest Maintenance Problem that Contributes Little, if Anything, to the Bottom Line, but Will Help Keep Organizations in Business*; presented to the Utah Capital Facilities and Administrative Services Appropriations Subcommittee, January 30, 1997.
8. "Year 2000 Future Shock," *State*, The Council on State Governments, June/July, 1998, p. 15.